

CURRENT LITERATURE.

Two new books for secondary schools.

Probably the most puzzling problem in botanical book-making is the preparation of a suitable book for secondary schools. The factors in the problem are limited time, little or no equipment and poorly trained teachers. In the higher stretches of education these factors disappear or at least such an assumption can be made. Many have been the attempts to solve the problem, but in most cases the demand for time, equipment, and training has been larger than the supply. Professor T. H. MacBride, of the University of Iowa, is the latest to enter this field with his "Lessons in Botany."¹ His theory is to be of the greatest advantage to the greatest number, and hence he seeks to give the necessary science training through the use of what are called "the common plants." This of course means the plants of popular knowledge. In accordance with this theory trees are first introduced by a study of buds, followed by stems, roots, leaves, inflorescence, etc. Then follows a series of types, with no special sequence further than convenience in securing the material. The last six of the fifty-four lessons are given to cryptogams.

The text is almost entirely in the form of laboratory directions, only those portions of it being didactic which are necessarily so to fill out the subject under discussion. Professor MacBride has followed out his theory in a very systematic and clear way, and the book will no doubt be very useful because usable, in the secondary schools, certainly far more so than many of its predecessors. We do not agree with Professor MacBride's position that the "natural order" of presentation is opposed to the "logical order," and that it is more natural for students to take up a subject in the order "in which all science has been developed." If the "natural" order of presentation, which is the artificial one, is to be followed rather than the "logical" order, which is the natural one, only until teachers of the secondary schools have been sufficiently trained to present the plant kingdom from the standpoint of its evolution, that is, from the standpoint of nature, we are content. We question though whether even this is necessary.

The other book² has been prepared by Mr. Bergen, the teacher of

¹ MACBRIDE, THOMAS H. — Lessons in elementary botany for secondary schools. Small 8vo. pp. xii + 233. Boston: Allyn & Bacon. 1896. 60 cents.

² BERGEN, J. Y. — Elements of Botany. 12mo. pp. viii + 275 + 57. Boston: Ginn & Co. 1896.

biology in the English high school, Boston. It is divided into two separately paged and indexed parts, the first treating the topic announced in the title, while the second consists of a very much abbreviated flora (with a key), including "a few of the commonest spring flowers of the northern and middle states." This part, which is a mere publisher's trap to catch the unsophisticated teacher or school board, may be dismissed as not representing the author's ideas and as unworthy serious consideration.

The most praiseworthy feature of the book is the point of view, and the method advocated and necessitated if the book is adopted. The point of view of the author is the only one from which the mass of students will obtain any adequate conceptions of plant life. The plant is discussed as a living thing having relations to other living things and to its physical environment. The structure of this being is examined only so far as it is related to plant dynamics. This presentation of morphology and physiology is combined with directions for dissection or experimentation illustrating the points discussed. It is the first book of the kind which has come to our knowledge and its plan must be commended as most excellent.

But the execution leaves a good deal to be desired. In the first place the author has been unable to shake off the traditions of the past as fully as he ought to have done. This is manifest in the relegation of the "flowerless" plants to a separate chapter of twenty-seven pages, where they receive wholly inadequate treatment. It is further shown in the disproportionately elaborate treatment of the flower. To the morphology of the flower and inflorescence as much space is given as to all the cryptogams, while forty pages more are devoted to fertilization and the fruit. One sees also the survival here and there of the antiquated features of the earlier books, *e. g.*, in the discussion of the structure of those stems and roots only which have undergone secondary thickening; in the retention of "exogenous" and "endogenous" as designating stem structure; in the description of the bud as a cluster of leaf rudiments with no reference to the fundamental importance of the growing point, etc. The book is also curiously lacking in logical arrangement and in definitions. Nowhere is the student told what a leaf, stem or root is, nor is he led to discover how he can distinguish the one from the other.

But it must not be supposed that the book is largely bad. By no means. In the combination of a large amount of physiology and physiological experiments with the morphology and dissection; in the general accuracy of what is given (though there are some slips here); and in the selection of the abundant illustrations the book is a distinct advance upon its predecessors.

It is worth while noting the fact that both books are entirely dependent upon accompanying laboratory work, as indicating the profound change which is coming over the botanical teaching in high schools.

Plant breeding.

The second volume of the "Garden-Craft Series," by Professor L. H. Bailey, is before us in tasteful dress.¹ It deals with the very interesting questions regarding the breeding of plants to secure fixation of desirable features. The book consists of five lectures, covering topics presented to the author's students.

In the first lecture the causes for the appearance of new forms of plants, and the fundamental methods for fixing these forms and making them permanent, are presented. The influence of soils and methods of treatment, effects of climate, the change of seed, etc., are discussed. The second lecture expounds the philosophy of crossing as well as its advantage as a means of originating new varieties. In the third lecture specific rules for the guidance of the cultivator are laid down, none of which are to be found particularly set forth in this connection in other readily accessible writings. The fourth lecture consists of translations of Verlot's classification of varieties of ornamental plants, Carrière's discussion of bud variation, including a list of bud varieties, and Focke's chapter on the characteristics of crosses. In the final lecture, directions for the cross pollination of plants are given in detail, with illustrations. A brief glossary and a good index are appended.

We particularly commend this book to botanists, who have too long let the garden fence bar them from the study of some of the most interesting and instructive phenomena of plant evolution. The first three chapters will be found of especial interest and value.

We must take exception, however, to Professor Bailey's statement that "the ultimate unit or individual in growing plants is the bud and the bit of wood or tissue to which it is attached" (p. 8). And also to this: "This unit [in which variations arise] is the bud and the seed, —the one sexless, or the offspring of one parent; the other sexual, or the offspring of two parents." The confusion regarding the sexual phase of seed plants ought not to be perpetuated, even in popular books, as it is throughout this book. Regarding this topic it is quite possible to be accurate without being abstruse, and the sooner we cease to call flowers "sex organs" the better, for gardeners as well as for botanists.

¹BAILEY, L. H.—Plant breeding. Garden-craft series, vol. II. 12mo. pp. xii+293. figs. 20. New York: Macmillan & Co. 1895. \$1.00.

But this morphological shortcoming will trouble too few, while the lucid and vigorous presentation of the chief matters will interest many, we hope.

General biology.

A second edition of the *General Biology* published by Professors Sedgwick and Wilson¹ ten years ago has given opportunity for a thorough revision and considerable changes in plan. The original plan provided for a general discussion of the fundamental properties of protoplasm and the forms of cells, followed by the thorough study of a plant (for which the bracken fern served as a type) and an animal (the earthworm). The difficulties in the use of the book arose from the exceedingly varied material necessary for the laboratory work on the first part of the book.

The chief changes in the present edition consist in the elimination from the body of the text of all laboratory directions, in lieu of which suggestions are made to teachers in an appendix; in the transfer of the study of the animals to precede the plants; and in the introduction of a series of unicellular animal and plant types.

The first change we think wise, but regret that the suggestions are too brief for those who need them at all. The second change, on the plea of the "ease with which the physiology of the animal can be approached; there can be no doubt that beginners find the nutritive problems of the plant abstruse," seems to rest upon a false premise. If beginners find the vital phenomena of a plant difficult to grasp, the fault lies with the teacher and the presentation—not with the character of the phenomena, which are vastly simpler than in the animal. The authors, who are zoologists, state their own experience, probably, and the reason may be valid in such cases; but their assertion that "there can be no doubt" is too strong for botanists to accept.

The introduction of the unicellular plants, protococcus, yeast, and bacteria, after the study of *Pteris*, seems to us an anomaly. Perhaps if a study of the physiology of protococcus preceded that of the bracken fern the authors would not find the latter so abstruse.

For the material of the book, the clear illustrations and the lucid style we have only praise.

Minor Notices.

YAKUTAT BAY, Alaska, was explored by Mr. Frederick Funston in the summer of 1892, under the direction of the Division of Botany of the Department of Agriculture. The results are just now published

¹SEDGWICK, WM. T., and WILSON, EDMUND B.—An introduction to general biology. Second edition, revised and enlarged. 8vo. pp. xii + 231. figs. 105. New York: Henry Holt & Co. 1895.

(Jan. 15th) as vol. 3, no. 6, of the "Contributions from the U. S. National Herbarium." An interesting field report is presented by Mr. Funston, which well points out the peculiarities of the region. Mr. Coville, Chief of the Division, makes the botanical report, which consists of a catalogue of the 137 vascular species and varieties, and 27 bryophytes, with habitats and critical notes. We regret exceedingly to note that this government publication has adopted a new family nomenclature. A certain amount of discussion and agreement may be claimed in support of the use of the rules of the Botanical Club, but to supplant such names as Cruciferae, Leguminosae, Umbelliferae and Compositae, by Brassicaceae, Fabaceae, Ammiaceae and Carduaceae is the merest pedantry, and is straining after uniformity when uniformity is not necessary.

MINNESOTA BOTANICAL STUDIES, part 7, contains five papers. (1) On the genus *Cypripedium* with reference to Minnesota species, by Henrietta G. Fox, deals with the formally adopted state flower, with descriptions and geographical distribution in the state of the six species of the Atlantic region. (2) Poisonous influence of various species of *Cypripedium*, by D. T. MacDougal, in which he confirms his earlier observation, showing that the poisonous action is due to glandular hairs. (3) Tree temperatures recorded by Roy W. Squires. (4) Some Hepaticae of Minnesota, by John M. Holzinger, is a list of 25 species. (5) A study of some Minnesota Mycetozoa, by E. P. Sheldon. Further editorial comment on nos. 1 and 5 will be found on p. 171.

A REPORT on collections made in 1894-95 by the Botanical Survey of Nebraska, conducted by the Botanical Seminar of the University, has just been issued. It is devoted to descriptions of new fungi and a list of additions to the reported flora of the state. The new species number fifty-five and the additions bring the state list up to 3,196 species.

MR. JAMES M. MACOUN, Curator of the Herbarium of the Geological Survey of Canada, is publishing a series of contributions from the herbarium. Numbers V, VI and VII are before us, reprints from the *Canadian Record of Science*, and contain additions to the flora, new stations, revised nomenclature and critical remarks.

THE "BOTANICAL SEMINAR" of the University of Nebraska has issued part 21 of its "Flora of Nebraska," containing the *Rosales*, by Mr. Rydberg. The handsome typography, good plates, and full treatment of the other parts continue. The statement of the relationships of various groups is full of interest, and careful synonymy blazes the way for those unfamiliar with the new nomenclature.